

IBAR hosts JUAV Time- Sensitive Operations

FOUR MAJOR PLAYERS ARE SIMULATED



Pilot pickles a weapon from his F/A-18" in the VPF.



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'War is the realm of uncertainty. Three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty.'

—Carl von Clausewitz, On War, 1832

The fog of war has grown even thicker, and managing the battlefield of the 21st Century is an incredibly complex enterprise. For new systems to be used with greatest effectiveness, they must be seamlessly integrated into the existing force structure. With the proliferation of military technologies, that's akin to inserting a new gear into the workings of a Swiss watch—while the watch is running.

Unmanned air vehicles (UAVs) are a case in point: they have enormous potential to increase the effectiveness of U.S. forces. However, they also require new methods of employment that will maximize their benefit to the forces and minimize conflicts with existing operations.

Following the Kosovo conflict, then-Secretary of Defense Cohen reported to Congress that "... the Department needs to improve the tactics, techniques, and procedures that guide UAV employment to better integrate their operations into overall campaign plans."

In early April 2001 an 18-member military and civilian project team assembled in the Integrated Battlespace Arena (IBAR) at China Lake to conduct an exercise called Joint UAV in Time Sensitive Operations (JUAV-TSO). The team represented the Naval Strike and Air Warfare Center (NSAWC); NAWCWD; VX-9; and two civilian firms, Simsum, Inc., and Systems Consultants, Inc., both of which are subcontractors to SENTEL Corp., the project's prime contractor.

Joint Test and Evaluation Program

JUAV-TSO was selected as a one-year feasibility study under the auspices of the Joint Test and Evaluation Program. The JT&E program integrates the expertise of the defense science community with the experience of the warfighter to solve complex joint operational problems. Competition for JT&E projects is stiff. Each Service screens its own nominations, then competes with the other Services.

Airborne in the IBAR

The IBAR was configured to simulate four major players. At the IBAR's Multiple Unified Simulation Environment (MUSE) station, a pilot flew a generic, tactical UAV over a detailed simulation of the Fallon Training Range Complex (FTRC). The UAV was equipped with electro-optical/infrared (EO/IR) imaging sensors and a laser designator. In the IBAR's Precision Engagement Center, Navy personnel manned a simulated Joint Air Operations Center (JAOC) that contained a time-critical targeting cell. The Data Link Lab was set up as a generic Airborne Command and Control (ABC2) aircraft to coordinate the target area engagements. And the IBAR's Virtual Prototype Facility (VPF), configured as a strike F/A-18 equipped with a laser spot tracker, carrying GPS and conventionally guided weapons, and "flown" by a qualified F/A-18 pilot. The real-time out-the-window display, like the UAV display at the MUSE, showed actual FTRC terrain and three-dimensional targets.



HAWKEYE— A pilot monitors operations in the Airborne Command and Control Center (IBAR Data Link Lab).



UAV controller guides the vehicle's sensing devices in the IBAR's Multiple Unified Simulation Environment (MUSE) station.

"Icepack, this is Hunter"

In combat, enemy aircraft do not linger on a runway and trucks do not dawdle at fueling stops. Operations against these targets must be conducted rapidly. The specific goal of JUAV-TSO was to evaluate two different UAV C2 architectures in just these types of time-sensitive operations. Each architecture is a structure of communication and authorization from first sighting to post-strike damage assessment.

In the IBAR, the participants' callsigns were Hunter (the UAV controller), Icepack (the battle watch officer in the JAOC), Nima (the targeting cell), Hawkeye (the ABC2), and Hornet (the strike aircraft). They used standard military voice-communications systems.

The first C2 architecture relied on Icepack to make all targeting and engagement decisions. This exercise began when Hunter located an enemy fuel dump with vehicles fueling and culminated in a strike by Hornet with precision guided weapons. The trucks and fuel farm were obliterated.

The second C2 architecture relied upon the UAV operator to make the targeting and engagement decisions. The targets were a pair of enemy aircraft next to each other on a desert runway. Hunter lased one of the aircraft with the UAV's laser designator, which guided Hornet's laser-guided bomb (LGB) to impact, destroying both targets.

JUAV-TSO moves on to Joint Test

When the OSD Joint Test and Evaluation Program's Senior Advisory Council met in late August 2001, it approved JUAV-TSO Project to move into the Joint Test (JT) phase. This will mean three to four years of additional testing and up to \$25 million in funding from OSD.

IBAR leaders expect to play a major role in the continuing JUAV-TSO JT, conducting simulated tests to help the JT director identify and solve potential problems before each actual live test. The IBAR will be used to evaluate alternatives used in real UAV testing with live assets. According to Licklider, "They'll do one week of simulation here for every week of testing. In advance of each major test event, they'll use the IBAR to try out their scenarios."

Cost-Effective, Real-World Simulation

IBAR's modular structure—nine individual laboratories and facilities that can operate singly or fully networked—and its ability to link with other laboratories and facilities through the NAVAIR Defense Network (DNet) have made it a key player in both the development and testing of weapons and tactics.

"We're very flexible," explains Bob Licklider, head of the Advanced Modeling and Simulation Branch, which oversees IBAR operations. "We have a virtual toolbox of capabilities that we can apply to create whatever scenario our customer needs." This type of interaction between simulation and live testing is a staple of IBAR activity.

The fog of war will never go away. But exercises such as JUAV-TSO, and facilities like the IBAR, will help friendly forces develop new systems and tactics to pierce the fog, to rapidly find the enemy, and to eliminate the threat.

